

Final Report: Community-Based Water Resource Management for Water Cooperation across a River Basin

Executive Summary

Water resource management can be a way to bridge the gap between communities located on opposite sides of a river basin. This can be done at the stakeholder level by utilizing the Human Integrated Management Approach (HIMA). Sharing knowledge of traditional methods of water resource management, including ethics and values, not only better a community's understanding of water sharing and cooperation, but is also an avenue of peace-building. The consequences of climate change, including reduced crop yields, floods, etc. will impact communities at the local level. t.

This research is intended to build the capacities of communities to prepare for the consequences of climate change through water cooperation across a river basin, using community-based approaches for climate resilience such as HIMA.

Research Objectives

This project aims to strengthen water and land use management capacity among West Asia and North Africa(WANA) countries through the adoption of the Human Integrated Management Approach (HIMA) to conservation. HIMA can be defined as a community-based natural resources management system that promotes sustainable livelihoods, resource conservation, environmental protection, human well-being, and social justice. This paper suggests adopting the HIMA concept in order to introduce the participating communities to a range of issues relating to climate change resilience and developing and managing water resources.

The study will contribute to the creation of an enabling environment for inter-country sharing of experiences, build capacity among all stakeholders, and strengthen information networks and knowledge-management systems. This in turn will permit the growth of a strong regional network of HIMA communities, with the idea that the whole is greater than the sum of its parts. Through interconnections and interdependencies, the individual elements of the network will contribute to each other's integrity by decreasing overall vulnerability, at both the ecological and governance levels. The main objectives are:

- To explore traditional methods of water management in three MENA countries (Iraq, Egypt, and the Palestinian territories);
- To transfer knowledge of successful models of community-based approaches;
- To explain and demonstrate through an analysis of the case studies how HIMA can be a tool for conflict resolution and peace-building;
- To help policy makers and development practitioners build climate resilience in communities at the local level.

This study was based primarily on desk research and a review of literature on traditional methods of water management on the local scale. It relied on development reports, academic papers, and

government data. The research identified gaps between different methods and offers an analysis of how to share knowledge to foster dialogue and water cooperation.

The three case studies compared community-based approaches to water management and evaluated how those approaches relate to the HIMA concept. The analysis addressed how cultural context impacts the approaches used and whether certain approaches can be replicated in other places. In each country the researchers identified water management approaches and specific community based approaches (CBA) used and examined how these were applied in a particular village or locale.

A mid-term meeting took place where researchers discussed each of the three case studies and made comparisons. The meeting lead to the formulation of initial conclusions and the identification of successful models of HIMA that could be promoted and replicated.

A number of challenges and constraints remain unresolved, namely: the formulation of a common definition and understanding of managing trans-boundary water; the establishment of a clear and concise political platform defining specific goals and priorities for action; and the adoption of an integrated approach to water management addressing economic and social issues alongside environmental priorities.

Introduction

HIMA, which means “protected area” in Arabic, can be defined as a community-based natural resources management (CBNRM) system that promotes sustainable livelihoods, resource conservation, and environmental protection for human well-being. The principles of HIMA CBNRM, practiced for over 1,500 years in the Arabian Peninsula, was modified by the Prophet of Islam by introducing social justice to the governance structure. The HIMA system is one of the most widespread systems of traditional conservation in the West Asia and North Africa (WANA) region and beyond, and is in use in countries including India, Indonesia, and the Philippines (Saleh & Hashemi, 2011).

Environmental protection, as a modern concept, has emerged in response to the environmental pollution and degradation linked to industrialization and globalization, and is of prime importance to the people who depend directly on natural resources for their survival. Therefore, HIMA is considered to be a relevant concept to contemporary natural-resources dilemmas. HIMAs are traditionally ruled by the local communities through consensus, and different groups hold specific responsibilities such as collecting rainwater run-off and monitoring grazing. This is one of the main strengths of HIMA: “...it provides an incentive for local communities to invest in the maintenance of their natural resources and to protect them from abuse.” (Kilani, 2007).

While climate change is a relatively modern phenomenon for much of the world, people living in Arab regions have coped with similar conditions for thousands of years. Across North Africa and the Middle East, populations have thrived despite issues such as desertification, drought, and extreme weather events. Many of the techniques developed over the centuries could be adapted to help other nations deal with climate change today. But the knowledge accumulated by these ancient societies has been largely absent from UN climate change negotiations, and people often have the mistaken belief that “dry lands are wasteland” when it comes to sustainability.

Worldwide, there is increasing recognition that sustainable development is not possible without the active involvement of local communities. This is especially true in the WANA region since natural resources (land and water), across the region have become subject to overexploitation and

environmental degradation. This does not only mean decreasing water and land productivity, but also losses in biodiversity and in the structure and functions of ecosystems. The conventional model of sustainable development that focuses on socio-economic aspects has had little success in the WANA region, as in many parts of the world. This is because conservation has focused on centralized planning and decision-making, and relied on governments to enact change. Conservation has not entrusted communities with the responsibility of managing their own water resources, and generally ignores local knowledge, traditions, and ethics—all of which can be the drivers of change.

Climate change may or may not intensify the risk for violent conflict in many parts of the WANA region. A past history of conflict in the Levant (Syria, Lebanon, Israel, Jordan and the occupied Palestinian territory) has left this area particularly vulnerable to future conflict (Brown and Crawford 2009). Water scarcity exacerbated by climate change could be a trigger for further political tensions, though it could also be a catalyst for peace-building (Brown and Crawford 2009). Studies have highlighted the role of international treaties on water in facilitating peace and collaboration among Arab countries; these treaties serve the dual purpose of reducing vulnerability to climate change as well as avoiding violent conflict over resources (Abukhater 2013). But adaptive efforts focusing on community-level projects to improve technology-sharing and participatory resource development can also be tools for peace-building (Brown and Crawford 2009).

In a study that looked at the adaptive capacity of 42 trans-boundary basins in the Mediterranean, the Middle East and the Sahel (MMES), it was found that most Arab basins including the Tigris-Euphrates, Lake Chad, Nahr El Kebir, and Asi/Orontes lack climate-change readiness. They are categorized as having “dependent instability,” characterized by high dependence on each other for water and unstable political ties (Milman et al. 2012). According to the assessment, adaptive capacity at the basin level will need to be improved through greater cross-border communication and collaboration if future water conflicts are to be avoided.

HIMA Conflict resolution Model

Based on the principles below, the research group developed a conflict-resolution model that addresses basic human needs for water cooperation and water sharing for communities across a river basin. Once communities are able to understand one another, water sharing may be accepted.

Hima Conflict Resolution Principles

Acknowledging and understanding rights of each other in terms of nationality	Conflict Resolution should lead to peace
<ul style="list-style-type: none">• Ethnic, cultural• Loyalty and kinship• Gender, peaceful existence• Mutual consultation process	<ul style="list-style-type: none">• Reform: I only desire reform to the best of my ability• Betterment of conditions: The best thing to do is what is for the people reconciliation and good

Therefore, HIMA Conflict Resolution Model (HCRM) is based on institutional and good-governance principles:

1. **Devolution to local community** by recognizing informal institutions and local traditional knowledge systems.
2. **Collective action principle** as a basis for the role of the state and voluntary sector. Fulfilment of basic goods and services are collective (socially obligatory) duties that must be fulfilled by the state. *Allocative and re-distributive role of voluntary sector* to be enhanced in achieving socially obligatory duties
3. **Financial sustainability principle** is based on:
 - a. Upkeep of the social welfare of the most vulnerable members of the HIMA community, through such actions as establishing a child welfare fund, the Zakat Wealth Fund, a reduction of tax burdens, etc.
 - b. Economic efficiency, for example extra taxes on goods and services to recover costs and enhance community accountability.
 - c. Payoffs for efficiency targets and penalties for non-compliance.
4. **Conflict resolutions** are based on
 - a. Acknowledging and understanding the rights of each other in terms of nationality (i.e. ethnic, cultural), loyalty and kinship, and gender.
 - b. Peaceful existence and calls for peacekeeping, peace-building and peace-making measures.
 - c. Conducting HIMA affairs by mutual consultation processes.
 - d. Conflict resolution should lead to *Eslah*, which can have several meanings:
 - i. social reforms and change of perceptions, perspectives, attitudes, and cultures;
 - ii. betterment of conditions;
 - iii. reconciliation using mediation and arbitration.
5. **Good governance principles** are:

- a. **Responsive:** Principles of humans are Trustees.
- b. **Accountable:** principle of humans are Stewards; participation in decision-making
- c. **Consensus oriented:** Principle of Consensus
- d. **Participatory**, based *shura*, or consultation and community participation
- e. **Clear:** transparency and clarity in information dissemination and policymaking.
- f. **Obedient to the rule of law**, to avoid chaos and injustice. Sanctions can be enforced as well as incentives to achieve environmental sustainability principles.
- g. **Legitimacy and capacity-development:** effectiveness and efficiency of the governance system is a measure of its legitimacy; capacity-development and the empowerment of ethical and moral obligations provide a basis for the legitimacy of the governance system.
- h. **Exercise of Knowledge and intellect:** knowledge is more than acquiring information; knowledge can be considered as a societal force embracing theory (belief system), enlightenment (Spiritual), thought (philosophical and scientific), and society (educational). Therefore, knowledge system is vital to any governance system

The HIMA governance vision and principles provide the objective criteria needed to address the six steps of the conflict resolution process:

- Step 1: Defining the problem
- Step 2: Generating possible solutions, like brainstorming
- Step 3: Evaluating the various solutions
- Step 4: Deciding on a mutually acceptable solution
- Step 5: Implementing the solution
- Step 6: Evaluating the solution

The proposed HCRM has the following components:

1. Crafting a Multi-Stakeholder Platform (MPS), namely a HIMA Conflict Resolution Council within the HIMA River Basin Council, with formally delegated powers addressing local issues and problems.
2. Developing a Conflict Resolution Charter: this document represents a starting point and minimum policy description for the HIMA conflict resolution procedure and stems from HIMA vision and governance principles. The Charter can be refined and extended as required and desired by the River Basin Council using its mutual consultation/consensus decision process.
3. Conflict resolution procedures should support the HIMA vision, governance principles, and the legal framework as described earlier.
4. Recognizing diversity and the rights of each other in terms of nationality (i.e. ethnic, cultural), loyalty, kinship, gender, etc.
5. Identifying and acknowledging real conflicts, contradictory goals and opposing interests based on separating people from conflicts.
6. Developing a peaceful existence strategy, i.e. peacekeeping, peace-building and peace-making measures.
7. Assessment of conflicts:

- a. analysis of the conflict should use the HIMA vision and governance principles to make sure that the goals of the various stakeholders are legitimate;
 - b. assess the nature and the history of the conflict;
 - c. assess what attempts have previously been made to resolve the problem;
 - d. assess the level of trust and respect between parties.
8. Invent solutions for mutual gain that are fair to all parties: the options should conform to the HIMA vision and governance principles. The options should seek common good. Conflict resolution options should lead to societal reforms/changes in attitude and cultures, betterment of conditions, and reconciliation between people using mediation and arbitration.
9. Make decision based on consensus.
10. Communicate the outcome very clearly to all the stakeholders and the community in large.
11. Establishing a post conflict resolution strategy by reassessing the decisions made through the MSP.

Egypt Case Study

1. Introduction

This case study looks at community-based adaptation approaches to water resources in the city of Aswan. This city was selected because its populace of Nubian people are unique in Egypt; they were displaced by the hundreds of thousands from their communities to allow for construction of the High Aswan Dam (HAD). They have faced many trials with respect to livelihood changes and water management, and have endured and coped with these trials through community-based approaches. This research looks at the water management practices of the Nubians prior to and after the construction of the HAD. This research is intended to determine whether the Nubians utilized the main principles of HIMA for conservation and preservation. It relies mainly on existing literature and research produced by white papers and various publications. It is expected that field research will be conducted in the future to validate these results.

2. Background of High Aswan Dam

The High Aswan Dam (HAD), opened in 1970, is the largest dam in Egypt. It is about 3,600 meters long and 111 meters high, with 12 turbines each rated at 175 MW. It generates over 10 billion kilowatts of electricity every year. Lake Nasser was created behind the HAD and is the largest artificial lake in the world (560 kms in length). The HAD has had enormous ramifications for Egypt, both positive and negative (Osman, 1999). A major problem faced in its construction was the displacement of the Nubian community and the disappearance of Old Nubia.

3. Resettlement of the Nubians

More than 100,000 Egyptians, mostly Nubians, were displaced to build the dam. Most of these were moved 45 km downstream, to an area called Kom Ombo (now known as “New Nubia”) (Biswas 2002). Housing and facilities were built for these populations and 18,000 *feddans* of land were reclaimed and irrigated through three channels coming from the Nile. The reclaimed land was intended to boost agriculture while providing a source of economic activity for the displaced communities. Sixty percent of the land was to be cropped in sugar cane, the harvest of which would double the intake of a nearby sugar refinery (El-Abd 1979).

New Nubia was populated by the displaced Nubians as well as Saiydis, an Upper Egypt peasant population. Many children and elderly died in the process of resettlement.

4. Peoples Livelihoods

It was anticipated that Lake Nasser would produce 25,000 tons of fish a year. In reality, the fish catch there declined dramatically due to weeds, and today only a small number of families make their living off fishing. Water from Lake Nasser was also used to irrigate farm land.

Historically, date palms were the Nubians’ main cash crop. They irrigated their land through jointly owned water wheels, which became a critical part of Nubian culture and identity. As stated by Scudder (2003):

The ownership of the water-wheel is connected with the ownership of the land, because every share owner of the land must help build the waterwheel and also donate one of its parts. The

water-wheel system permeates all aspects of social and economic life. The water-wheel has helped create a method of partnership in the ownership of cows used to run the machine, and a useful system of land division, both of which strengthen the relationship of the various houses within families.

The water-wheel sharing system demonstrates one of the strongest aspects of the principles of HIMA.

The resettlement was mostly opposed by Nubians, who had livelihoods that did not depend on agriculture. Many Nubians made or sold sailboats, for example. Some Nubians, however, adapted to the new circumstances and adopted new agriculture practices and crops. Some Nubians farmed the new land themselves, while those with little farming experience entered into share-cropping agreements with the Saiydis. In addition, many turned to livestock management for income (Biswas 2002). Coping strategies of share-cropping also constitutes one of the principles of HIMA.

A small group of Nubians left the resettlement area and returned to parts of Old Nubia along the shores of Lake Nasser. Four small traditional villages were rebuilt in this area by the 1980s. According to Geiser (1986):

...the Nubians continued to have a deep attraction to Nubia. Nubians had always stated that their native land was 'blessed.' They considered the climate, land and water superior to that found anywhere else in the Nile Valley, and they believed their communities, which were relatively free of outside influence, to have the highest standards of peacefulness, cleanliness, honesty, and personal security in Egypt.

The ability of the Nubians to adapt, cope with and ultimately survive the circumstances is remarkable. However today they suffer from scarce resources and growing poverty levels.

5. Conclusion and evidence of principles of HIMA

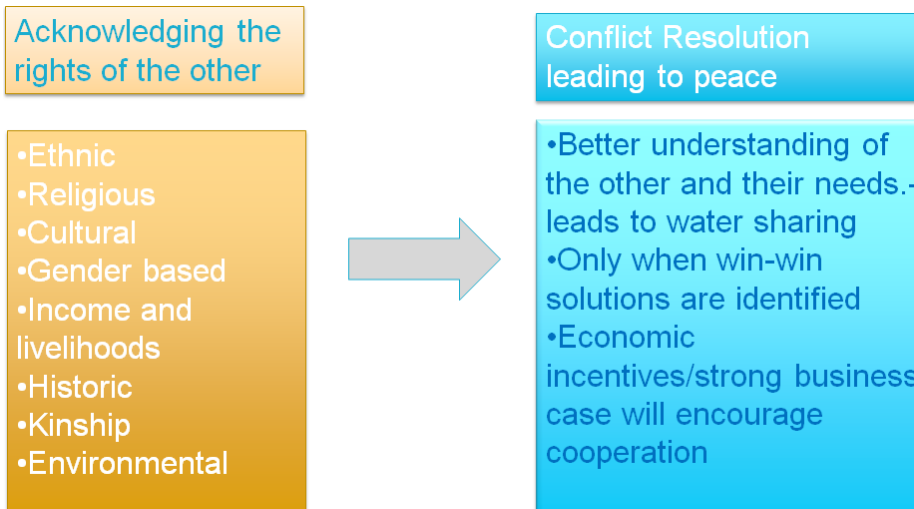
The Nubians proved to be quite resilient with respect to containing their identity and national heritage, but much of their livelihood patterns were altered due to their resettlement and adaptation was a necessity. Their mechanisms of adaptation to water management were in some cases based on principles of HIMA, such as how the Nubians functioned as a community with respect to shared resources and shared-holdings.

HIMA is also seen in the ways that the Nubian strongly self-identified culturally with the resource to be preserved. Protecting and conserving the Nile's waters was an ethical principle and expression of appreciation of the resource. The Nubians had a strong affiliation and ethnic connection to the Nile's waters and were cautious about its usage.

The institutional principles can be seen in the Nubians' acceptance of the role of the state in providing their basic needs during their resettlement phase, and with their shared holdings with the Saiydis for land cultivation in the Kom Ombo areas.

More field research is needed to investigate the HIMA principles in practice on the ground.

Fig. 3: Conflict Resolution Model



The Conflict Resolution Model above shows the basics of how the HIMA principles can assure sustainability of a water resource in a river basin through communities identifying with one another. The concept of acknowledging the rights of the other were evident not only within the Nubian community itself but also with respect to their co-inhabitation with the Saiidis in Kom Ombo. The Nubians were able to identify with these people not on the basis of ethnicity or culture, but on the basis of a common understanding of income and livelihoods for land cultivation. The Saiydis were prominent farmers and quite familiar with the terrain and soil structure of the area; the Nubians were not originally farmers and yet were given land as compensation for resettlement. This created an economic incentive and a strong business case that encouraged cooperation and share-holding.

More field research and in-depth study is needed to identify the scope of HIMA principles and water-management practices on the ground. However, based on the existing literature that was produced on this topic, a preliminary assessment indicates that the Nubian community does in fact apply many of the HIMA conflict resolution principles within their communities to varying degrees and contexts and certain times and area. More however is yet to be explored from these communities.

Iraq Case Study

1. Introduction

Being a farmer in the upstream side is quite better than being a landowner in the downstream side. – traditional Kurdish saying

In Iraq, water-sharing in the Tigris and Euphrates River Basin is used as a case study to illustrate the usefulness of HIMA and the HIMA conflict-resolution model.

2. Water Resources in Iraq

Iraq is not traditionally a water-scarce country, but it suffers from severe mismanagement of water resources. The Euphrates and Tigris rivers constitute a major water source are used to irrigate roughly 67% of the country's cultivable land (FAO 2011).

The annual inflow of water to Iraq from the Euphrates has declined steadily over the last 50 years. From 1933 – 1971 the average annual inflow was 30.44 BMC; this dropped to 19.69 BMC from 1994 – 2007 (Al- Mahdawi 2012). In the last four years (2008 – 2011) average annual inflow dropped to just 12.75 BMC. Annual flow from the Tigris has also declined, dropping from 49.22 BMC during 1933 – 1998 to 33.10 BMC during 1999 – 2011 (ibid.). This decline can be attributed mainly to the surge in construction of dams and barrages as well as changing climate patterns.

A major consequence of the reduced river flows in Iraq was the destruction of almost 93% of the country's famed marshlands (ibid.). This has lead to the marginalization and near disappearance of entire communities of marsh Arabs. Only about a third of the marshlands have been restored since their destruction.

Iraq's water use patterns and infrastructure are placing further pressure on water supplies. Water distribution and sewage systems, suffering from years of disrepair due to war and looting, now have water loss rates of about 50 – 60% (Michel 2012). By 2015, the total available water supply in Iraq is expected to fall to just 43 km³, about 23.85 km³ less than projected demand (ibid.).

Climate change would only exacerbate these threats and magnify water shortages. Snow-melt from the mountains of east Turkey contributes up to 70% of the water that feeds the Tigris-Euphrates Basin, with the remaining 30% coming from rainfall. A decrease in snow-melt or precipitation in the basin's headwaters will further decrease water flow and increase the risk for conflict (Republic of Turkey 2007).

3. Dam Construction in the Euphrates-Tigris Basin

Iraq, the last downstream state in the basin, was the first to develop dams on the Euphrates and Tigris, first in 1914 again in the 1950s. In the 1960s both Turkey and Syria began construction of their own major dams. However, the largest intervention came in the form of Turkey's South-eastern Anatolia Project (GAP), launched in the 1980s with the aim of building twenty-two dams and nineteen hydroelectric power plants. Syria and Iraq have since voiced extensive opposition to the project due to the expected reductions in their water supplies. A number of bilateral water agreements were signed between the riparian countries to set minimum flow rates for Syria and Iraq. However, more substantive efforts to address equitable water allocation across the basin have yet to be made.

One study assessed that upon completion of the GAP, outflows in the Tigris and Euphrates would decline by 25% and 32% respectively (Tilmant et al. 2007). Other experts have suggested that the project would decrease the flow of both rivers by around 50% (Daoudy 2009). In addition to these direct losses, some of the river water used for irrigation in Turkey is expected to seep back in to the rivers as agriculture runoff. This would pollute approximately “...40 percent of the flow entering Syria from Turkey and 25 percent of the Tigris waters running from Turkey into Iraq” (Michel et al. 2012).

4. The Ilisu Dam

Turkey’s Ilisu Dam, situated on the Tigris River, is nearing completion and will start impounding in 2014. It is located just 70 km upstream from the Iraqi border poses a direct threat to Kurdish communities downstream. Experts predict a decline in Iraq’s share of water from the Tigris reaching 11 BCM.¹



Fig. 1 The Ilisu Dam in Turkey: A Major Threat to Iraq’s Water

5. Impact on Kurdistan

The Tigris-Euphrates basin is populated largely by Kurds in all four riparian countries (Turkey, Syria, Iran, and Iraq). Kurdistan, in the northern part of Iraq, is managed by the Kurdistan Regional Government (KRG) and was recognized as a federal region in the Iraq Federal Constitution of 2005. Pursuant to the constitution, Iraqi Kurds have autonomous rights and governance systems.

The Iraqi Kurds believe their land is blessed. It is thought that the biblical ship of Prophet Noah docked on Mount Judi in Kurdistan. As an historically water-rich region with fertile soil, Kurdistan was considered the breadbasket of Iraq and was where farming and animal husbandry was first practiced in early civilizations.

¹ Personal Communication, Dr. Ramadhan Mohamed, November 27, 2013

The continued construction of dams throughout the basin is one of the biggest risks facing the Iraqi and Kurdish populations. It is thought that the completion and operation of the planned dams will rob Kurdish communities of their right to the waters of the Tigris and the Euphrates while diminishing their livelihoods, increasing environmental vulnerability and impacting their cultural heritage.²

6. HIMA Conflict Resolution Model

The KRG is taking steps to enhance the agriculture sector and manage local water supplies. The principles of HIMA can be applied there to strengthen the once prevalent village-based natural resource management model and ensure more equitable and sustainable resource use.

According to the conflict resolution process outlined in the above sections, the problem can clearly be defined as unilateral actions intended to inequitably distribute trans-national water resources in the Euphrates and Tigris Basin. Solutions need to address both international negotiations between basin states and support sustainable water management at the local level.

In Kurdistan, local communities have lost the interest and ability to manage or protect their water resources. By implementing HIMA, traditional and community-based approaches can be nurtured and restored, and combined with a Multi-Stakeholder Platform at the basin-level. Not only will this promote stewardship and more efficient management of local water resources, but it will also help reduce conflict at the basin level by giving communities a say in water negotiations.

² Personal Communication, Dr. Ramadhan Mohamed, November 27, 2013

Palestinian Territories

Case Study

1. Introduction

This case study looks at community-based adaptation approaches to water supply in the Nablus area. The city of Nablus, through its municipality, supplies water to the city itself as well as to the surrounding refugee camps and some of the villages. These communities are different in density and socio-economic status. Nablus was chosen for this case study because its community members have faced trials with respect to livelihoods changes and water management, and have endured and coped with these trials through community-based approaches. Villagers were selected due to their unique nature in Palestine since they were living in poor conditions their livelihoods were altered to means of access to water and other resources too. This research looks at the water-management practices of Nablus prior to the construction of deep wells, main pipelines, and reservoirs, and investigates if current water management in Nablus follows the main principles of HIMA. A follow up field research conducted to validate these results. This case study provides an overview about the water problems in Nablus from the outset.

2. Coping and Adaptation Strategies in Nablus and Neighboring Villages

Nablus is located in the middle of West Bank, about 65 km to the north of Jerusalem . It is considered the main metropolitan area of the northern region of the West Bank. The HIMA principles about conflict resolution can assure sustainability of a water resource in Nablus area largely different, but based on a common understanding of income and livelihoods for land cultivation which required a change in their livelihoods and income. This essentially created an economic incentive and a strong business case that encourages cooperation between Nablus City and its surrounding villages.

Based on the existing literature on the topic, many of the principles of HIMA and its conflict resolution model may be broadly applied in Nablus. However, more field research and in-depth surveys are needed to identify the scope of these principles on the ground.

Villages surrounding Nablus are in poor conditions. Residents have no access to water and there is a very high unemployment rate. Nablus City found water sources nearby the villages. Both villagers and city dwellers have a common interest in sustainable water resources, but villagers do not have the money to invest in development nor the experience to run the system. The City aimed to provide stable conditions and increase economic activity, so villagers remain on their land rather than immigrate to the city. The city's main water source provides water to the people Nablus area year-round, allows for several crops to be grown in a year (rather than just one), and allows more of land to be established for crop growing.

Nablus municipality took first step toward developing a governance system in 1933. Starting Deep negotiation with the local community in Nablus Area ended that Nablus Municipality took over water resources management which was only springs. This represents major shift towards sustainable development of water system taking into account the need of water resources for the society, bearing in mind the rights of the original owner of the yield of springs. As an example, Nablus tried very hard to maintain the Spring of Zawata Village near Nablus, pump the water from the spring to a reservoir at a high point in the village and allow the water to reach the houses of the villagers and their farms by gravity. Also, Nablus Municipality provides water to the refugee camps with a very low cost. Nablus Municipality considers the local community-based sharing very essential were everyone at the end found that he won.

By establishing a water-pipe network, the Nablus municipality was able to serve the greater Nablus area, thereby reducing social disparities and developing community participation.

In 1963, the Nablus municipality started looking for water resources other than the springs. New sites were found as a result of hydraulic study. The new sites were outside the city and near villages' area. Nablus Municipality started negotiation with the people of the village ended to give them share of water. Negotiation based on per capita consumption l/c/day, and the Municipality gave water to this community with low price for the first block of certain amount of water. In 1970 this was repeated with another community which was given water but based on real cost of the services. Nablus Municipality Shared water with this village, and this village agreed to pay the cost recovery of cubic meter; also they had the same rights as all people the area. In 1997 the same was repeated with other villages. Nablus Municipality agreed again to give water to villages and the available water was divided equally between them.

In 2008 a new water resource was added to Nablus Municipality, leading to the following community agreement:

- 1: Each society will receive a set amount of water for domestic (not animal or agricultural) purposes.
- 2: The quantities of water supplied will be based on the per-capita consumption (L/c/day) and population.
- 3: Cost of cubic meter must be covered through agreed tariff.
- 5: Industrial demand is not included.

3. Conclusion and evidence of principles of HIMA

The villagers proved to be quite resilient with respect to containing their identity and national heritage, but much of their livelihood patterns were altered due to their staying and hence their adaptation was a necessity. Their adaptation to water management was in some cases based on principles of HIMA in full, as seen in specific elements of how the villagers and city of Nablus functioned as a community with respect to shared resources and shared holdings, and in ethnic identification with the resource to be preserved.

Through the principles of HIMA, sustainable development in the water system of the Nablus area could be achieved. Since 1930 water sharing has been common in Nablus. The owners of available springs often shared their water to meet the water needs of Nablus city residents. Nablus Municipality also established the water department to provide people with water and that had been fairly distributed among all consumers.

In the 1960s, new sources of water from deep wells were also shared among people of Nablus and surrounding villages. This led to sustainable development taking into consideration as local communities needed drinkable water in the long term, they felt their voice heard and they trust the water department. At the end everyone felt that he was partner in the water system.

The Case Studies in Relation to HIMA

HIMA governing principles

- Ethical:
 - Optimal utilization of the resources based on appreciation for the resource, i.e., no excessive use by any one party;
 - Equitable use and distribution based on fairness and justice
 - Environmental integrity based on condemning aggression, harm, and abuse
- Environmental sustainability:
 - Based on reverence for natural resources
- Institutional:
 - The role of the state in providing basic needs,
 - The role of the voluntary sector to contribute to socio-economic and non-material development of the community, and
 - The devolution of resources management within the local community.
- Good governance Principles
 - Principles provide a framework for the adequate management of the natural resources

If we refer to the various HIMA principles outlined above it can be seen that each of the case studies demonstrates various aspects of these principles within varying contexts and degrees.

Evidence of HIMA in each Case Study

Egypt:

- Sharing between community members of the Nubians (Ethical Principles).
- Strong national identity to the Niles. The Nubians have a strong affiliation and ethnic connection to the Nile's waters and are cautious about its usage (Environmental Sustainability Principles).
- Coping strategies of share-cropping.
- The Institutional principles apply with the Nubians' acceptance of the role of the state in providing their basic needs during their resettlement phase, and with their shared-holdings with the Saiidis for land cultivation in Kom Ombo areas. (Institutional Principle)

Iraq:

- On an international level, there have been bilateral negotiations but no concrete platform for dialogue and conflict resolution. Using the model as a guideline, a first step is to create a Multi-stakeholder Platform (MPS) such as the Tigris-Euphrates River Basin Council to address water allocation issues. This forum will allow for greater dialogue and should embody the HIMA principles of responsiveness, accountability, consensus building, participation, transparency, rule of law, empowerment, and equality and information sharing (Institutional – Good governance principles)
- At the local level, greater community participation in water management needs to be fostered. In line with the HIMA framework, delegating planning and management tasks to the local or village level can help improve their relevance, effectiveness and sustainability. (Good Governance – Devolution to local community principles)
- Village-level institutions must be strengthened to be able to monitor water usage and engage the surrounding community in resource management. By delegating this, local residents can be

more involved in identifying local priorities and allocating resources to village needs. (Devolution to local community principles – Good governance principles)

Palestine:

- The villagers and city of Nablus functioned as a community with respect to shared resources and shared-holdings, and identified ethnically with the resource to be preserved. (Ethical and Environmental Sustainability principles)
- In 1960 again new sources of water from deep well were shared among people of Nablus and surrounding villages. This led to sustainable development being taken into consideration as local communities needed drinkable water in the long term. These communities felt their voice had been heard and they trusted the water department. At the end everyone felt that they were partners in the water management system. (Collective action principles – Institutional principles)

Conclusions and Recommendations

From this analysis it can be seen from the case study examples that Egypt mostly applied the ethical, environmental sustainability, and institutional principles of HIMA; Iraq mostly applied the Institutional principles of good governance and financial sustainability of HIMA; and Palestine mostly applied the ethical, environmental sustainability, and institutional principles of HIMA.

The concept of HIMA will take markedly different forms in different contexts. As demonstrated, each case study has different key elements of the HIMA governing principles which can be built upon. They also have different types of conflict that can be addressed by the HIMA conflict resolution model.

In Egypt, the challenge is for a community long displaced by the High Aswan Dam to remain involved in the sustainable use of land and water.

In Iraq, the threat of conflict looms as Turkey moves forward with its South-eastern Anatolia Project (GAP) and construction of the Ilisu Dam. In this context, the conflict resolution model can be used to reconcile Kurdish communities and Turkish authorities to arrive at mutually beneficial and equitable water distribution.

In Nablus, the resource conflict is very different. Water scarcity in this area is due in large part to the political constraints put on Palestinians as a result of the occupation. Local traditions of water management and sharing helped ease resource tensions.

The implementation of HIMA principles needs to be contextualized to local settings and conditions in order to best to apply them. The HIMA Conflict Resolution Model is a tool used to enhance the capacity of local communities for water management and allow them learn from their existing traditional coping strategies. HIMA cannot be applied in its entirety without understanding fully the local context.

Many of the more successful models of water-sharing today use many of the elements within the HIMA model, which has enhanced resilience, adaptation, and coping strategies as a whole. Further analysis on

each of the case studies and additional field research is needed to determine how HIMA can best be implemented to address resource conflicts. A next step forward would be to examine whether or not different communities across the same river basin or sharing a common water source utilize the same or different HIMA principles, and how these communities can learn from one another in terms of coping strategies.

Recommendations:

- Highlight successful examples of HIMA across the Arab region to build a base of knowledge that can be shared and built upon in developing more equitable, sustainable and democratic water management systems.
- Identify synergies and common areas between HIMA practices.
- Implement HIMA in river basins in regions including the Tigris Euphrates Basin, Nile River Basin, and Jordan River Basin.
- Promote the creation of Multi-Stakeholder Platforms (MPS) with formally delegated powers to deal with local water conflicts, and ensure that a conflict resolution charter stems from HIMA vision and governance principles.
- Focused efforts are needed to build the capacity of community-based associations and localized institutions to ensure their participation and close involvement in resource management.
- Invest in continued research on the implementation of HIMA in river basins as an approach to climate change adaptation.

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